Mr. Andrews showed a number of views illustrating the structure and other features of the district and its coastline.

On one afternoon the section joined with Sections C and K to listen to an illustrated lecture by Prof. Conwentz on the need of preserving what may be called "natural monuments" (typical scenery, flora and fauna, &c.), and the measures adopted or to be recommended to this end. Another lecture, by Mrs. Leonidas Hubbard, presented a graphic account of a journey in Labrador, during which the lecturer completed the work begun by her late husband in the survey of two previously unexplored rivers, the navigation of which is rendered difficult and dangerous by the many falls and rapids. Lastly, a short extempore account of the general and economic characters of British New Guinea was given by Dr. W. M. Strong, a Government official who had just arrived in England on furlough.

Reports were presented by the committees for investigations in the Indian Ocean (Mr. J. S. Gardiner); for the study of the relations between rainfall and river discharge (Prof. McCallum and Dr. Herbertson); and for that of oscillations of land-level in the Mediterranean (Mr. R. T. Günther); and grants were obtained for the further prosecution of the work of the two first.

EDUCATION AT THE BRITISH ASSOCIATION.

TWO joint conferences were held, the first with Section H, on *Anthropometrics in Schools.* The report of a committee of Section H on anthropometric investigation in the British Isles was presented by Mr. J. Gray (secretary). The anatomical subcommittee reported on methods of taking chest measurements, on hair colours, and on iris colours. A series of schedules of proposed anthropometric measurements for the use of schools has been drawn up, suggestive as to what could be done with limited opportunities. A psychological subcommittee has drawn up a list of thirty-four mental characters, on which they suggest observations on a scale indicating average or more or less marked over or under development of each character. The educational subcommittee (Mr. E. N. Fallaize, convener) states some of the aims of anthropometric observations in schools as the determination of averages and standard deviations, the correlation of physical and mental growth, the detection of the unfit, and the testing of the efficiency of different systems of education. Mr. J. Gray recommended that measurements and observations in all schools should be made in accordance with the scheme of the Anthropometric Committee of the British Association, that the data obtained should be entered on the card schedules, and each subject's dossier kept in an envelope as recommended by the committee. Dr. F. C. Shrubsall showed some lantern-slides of the results already obtained by anthropometric methods, including a comparison of the relative statures of Jewish and British children, the Jews leading at first, but both alike at age twenty-two; the heights of the professional, commercial, and artisan classes, the professional always leading: the percentage distribution of stature in Scotland, Liguria, and Sardinia, showing the Scottish stature as taller than the Sardinian; a map showing the average statures in different counties of the British Isles; the range of variation at different ages in schoolboys, showing that the tallest aged five was taller than the smallest aged ten. This demonstration was most impressive, indicating both the importance of the results already obtained and the risks of generalising from imperfect statistics or with inadequate knowledge.

The discussion thus begun was adjourned and continued throughout the afternoon. Sir Victor Horsley read a resolution already accepted in the committee of Section L:—"Resolved that, in view of the national importance of obtaining data on the question of physical deterioration, this association urges upon the Government the pressing necessity of instituting, in connection with the medical inspection of school children, a system of periodic measurement which will provide definite information on their physical condition and development." This resolution was afterwards adopted by the general committee of the association, and, pending further consideration by the council in November, it was agreed that it should be communicated to persons interested without delay.

Prof. M. E. Sadler hoped that a medical bureau would be instituted, preferably by the Board of Education, but with the cooperation of the medical staff of the Local Government Board and of the Home Office. It was desirable that the central authority should give supervision in order that observations may be made on a uniform basis. Mr. J. Ramsay Macdonald, M.P., regarded anthropometrics in schools as a necessary scientific basis for social legislation and educational policy. Mr. E. Meyrick, F.R.S., of Marlborough College, spoke on the practical difficulties in obtaining measurements of growth in schoolboys, perturbations and inaccuracies being so considerable that the final results were nearly valueless. Subsequent speakers, thinking perhaps of height rather than of growth (or difference of consecutive heights), freely declared that the accuracy of the measurements did not much matter so long as there were plenty of measurements used in the average, but no one indicated exactly what standards of accuracy were possible or desirable. Mr. Cecil Hawkins, of Haileybury, read a paper on types of physical development in schools. A series of diagrams was distributed having in each case age as the abscissa, and for ordinate either height, weight or girth. Across each of these a series of nearly equidistant curves was drawn to show the progressive development of twenty different grades of boys (each equally probable). This system makes it easy to plot the course of any individual boy and to compare him, not merely with the average, but also with his own type, and to see how his height, weight, and girth are losing or gaining relatively to each other. Prof. Findlay referred to the suggestions of Prof. Armstrong that more might be done to interest the scholars themselves in these measurements and in the necessary calculation of results.

The discussion on *The Scholarship System* afforded a full day's work, the morning being devoted to the transition from the primary school to the secondary day school, and the afternoon to the preparatory school, public school, and university. The opening paper, by Prof. M. E. Sadler and Mr. H. Bompas Smith, greatly assisted the discussion by focusing attention on points raised by their recent inquiry, the results of which will be most welcome on fuller publication. New sections of the community are demanding access to secondary schools, and it has become necessary either to extend the scholarship system or to embark upon a policy of free, or nearly free, secondary education under public control. Maintenance allowances are also necessary. The demand for secondary education has been accelerated by new regulations for the training of pupil-teachers. A scholarship system must give the opportunity of long training for individuals of unusual capacity, and not merely brief but widespread encouragement to average ability. The records kept of the later careers of scholarship holders are at present inadequate, but the evidence points to an overwhelming majority passing into literary, clerical, and other non-industrial callings. The scholarship question should be looked at from a national point of view, not only from the standpoint of the personal advantage and preferment of the individual scholar. Ability should be directed towards those callings in which the individual, by natural aptitude and by physical stamina, can best render valuable service to the nation. Hitherto preferential treatment has been given to the recruiting of the more literary professions. At present special advantage is given to urban districts. The fixed values of the scholarships at public schools and universities might well be reduced, but ample supplementary allowances should be given to those scholars who need them, after private inquiry into the circumstances of each case. The best examinations now conducted for junior scholarships are confined, so far as written tests are concerned, to papers in English and arithmetic. A simple oral test is desirable. The examiners should also have access to the pupil's school record. Stress should always be laid upon physical fitness; this would be an incentive to the healthy up-bringing of children and discourage neglect of the candidate's health. Mr. R. Blair, executive officer L.C.C., reported that the 2000 scholars selected annually were about the number who were fit to take advantage of secondary education, but this number was much less than the 25 per cent. of free places which secondary schools, aided by the Board of Education, were required to provide. He agreed to the principle of an oral examination and to making a fair standard of physical development a condition of eligibility, but he warned the audience as to the difficulties in applying such tests; for instance, a missing limb was an obvious defect, but doctors might differ as to disqualifying for anæmia. Mr. H. Bompas Smith said that we needed scholarships to train girls for callings other than that of primary teaching, and a greater variety of secondary schools to meet different needs.

In the afternoon Mr. G. Gidley Robinson spoke on the scholarship system as affecting preparatory schools. The Rev. A. A. David, headmaster of Clifton College, thought that the money value of all scholarships might be reduced to something quite nominal, but sufficient to serve as a symbol of the intellectual distinction; the remainder of scholarship revenue might then be converted into augmentation funds. Dr. H. B. Baker, F.R.S., reported that at Cambridge about 17 per cent. of scholars could have resided at the University without their scholarships, while at Oxford the proportion was only 6 per cent. There might be a voluntary relinquishment of the emoluments of a scholarship by a wealthy parent, the other privileges of the scholar being retained. Not infrequently a former scholar, on attaining to fatter fortune, has paid back in some way the money that was the foundation of his fortune. Prof. H. A. Miers, F.R.S., thought that scholarships should be awarded by examinations of a less special character, and should be administered by the university. The present system of grouped colleges is a step in this direction. Any exhibitions given otherwise than by examination should be administered by the colleges. Scholarships are required for advanced and post-graduate work. The whole discussion indicated a marked advance of thought on the scholarship question. The difficulties were clear, especially the poverty question. Suggestions were numerous and helpful. The general agreement on the proposals made was very clear, and was emphasised by other speakers.

Sir Oliver Lodge read the report of the committee, consisting of Sir Oliver Lodge (chairman), Mr. C. M. Stuart (secretary), Mr. T. E. Page, Profs. M. E. Sadler, H. E. Armstrong, and J. Perry, Sir Philip Magnus, Principal Griffiths, Dr. H. B. Gray, Prof. H. A. Miers, Mr. A. E. Shipley, Prof. J. Findlay, and Sir William Huggins, appointed to consider and to advise as to the *Curricula of Secondary Schools*; in the first instance, the curricula of boys' schools. "The committee submit for consideration the following conclusions which they have reached as the result of their debates:—(1) There is need for secondary schools of different types, with different curricula or combinations of curricula, because (*a*) all boys are not suited to the same course of study; (*b*) the requirements of the various callings upon which the boys will subsequently enter differ considerably; (*c*) the needs of the schools differ in a considerable degree according to the economic conditions of the districts in which they are situated. . . . (2) The committee consider that one modern foreign language should in all cases be begun at an early age, but are of opinion that it would be a wise educational experiment to postpone the *systematic* teaching of Latin as an ordinary school subject until twelve years of age, and that such a change will prove sufficiently successful to warrant its adoption. . . . The committee also desire to record their opinion that the continued teaching of either of the two dead languages to boys who after serious trial have shown little or no progress in, or capacity for, such linguistic study, has little or no educational value; and that, though the mental training afforded by such study is of great value in the case of many boys, yet in the case of others such study not only produces no good results, but does positive harm to their mental and moral progress by reason of their incapacity to grapple with its difficulties. The committee go further, and express their doubt whether the authorities in some secondary schools have sufficiently recognised this fact or have provided sufficient alternatives to such linguistic study. (3) The committee deprecate any form of early specialisation in the education of children, and therefore regard with grave concern the fact that the entrance examinations at the great English public schools give undue prominence to the study of Latin (and Greek) in the course of education at the preparatory schools, the result being that too little time is available for (*a*) the teaching of the mother tongue, (*b*) manual training, (*c*) science and mathematics. (4) The committee would deprecate anything like State-imposed rigidity in the organisation and studies of secondary schools. . . . (5) The committee are of opinion that the curriculum in secondary schools suffers gravely from the number of subjects which have been crowded into it. . . . (6) The committee desire to see a great simplification in the arrangement of examinations for secondary schools, and they strongly recommend that examination and teaching should go hand in hand, the examiners cooperating with the teachers and acting in conjunction with them in order to further the interests of real education. The committee would urge upon the universities and professions to accept as qualifying for entrance the leaving certificates granted by each university to the schools which submit to its inspection. . . . The committee particularly deprecate any uniform or centrally administered examination applied to all the schools of the country. . . . (7) The committee feel that no scheme of secondary education can be satisfactory unless it is carried out by teachers of learning and force of character, and they would urge that every effort should be made, by conditions of appointment, by scale of salaries, and by retiring allowances, to attract a high class to the teaching profession, which should be regarded as a very laborious, but very honourable, form of public service. . . ."

In this and other discussions there was much keen criticism of the Board of Education. The burden of it was distrust in matters which could be put on a scientific foundation. A subcommittee of the curriculum committee has been appointed at the request of Mr. G. F. Daniell to report on the sequence of scientific studies. Prof. Armstrong directed attention to the dangers of State control, to the importance of manual training as a branch of intellectual education, and to the administration of the examination system, not with altruistic motives, but as a lucrative business. A committee of Section L has been appointed to watch legislative and administrative action. Dr. Anderssen, of Christiania, reported the gymnasium for boys of fifteen to eighteen years as divided into three branches, one with mathematics and science as the centre, one with modern languages, chiefly English and history, as the centre, and one with Latin as the centre. Prof. L. Morel, of Paris, spoke of France as a field for experiments. For the years fourteen to seventeen, boys are grouped in four sections. Section A is characterised by Latin and Greek, B by Latin and foreign languages, C by Latin and sciences, and D by sciences and foreign languages. The last is the normal course for those who learnt no Latin before fourteen or who choose to abandon it.

Mr. R. E. Thwaites reported the results of his inquiry into the *Conditions of Science Work in Secondary Schools.* The average number of boys in a class is twenty-one or twenty-two, but twenty should be the maximum for a laboratory class. The average expenditure per boy on apparatus and chemicals is about 1*l.* per annum in public schools and 8*s.* 6*d.* in secondary day schools. From two-thirds to three-quarters of the schools are satisfied with the number of the science staff, the laboratory accommodation, and the equipment of apparatus, but little more than half have any laboratory assistant, the more expensive time of the science master being spent on details which could be performed less expensively by an assistant.

A joint meeting was held with Sections D and K on *The Teaching of Biology in Schools*, introduced by a paper from Mr. O. H. Latter, of Charterhouse. In the preparatory school and lower forms of public schools the standard indicated as "nature-study" seems the best form of science training. Common animals involving direct personal observation were more suitable in the next stage than the "type-method" with its underlying idea of evolution. A year of chemistry and physics might be interpolated before physiology. With older and cleverer pupils pure nature-study methods become insufficient. As the mind matures it must have more solid matter to digest. The theory of evolution was beyond the grasp of any but the best class. Prof. Hickson agreed that the ordinary course of biology was unsuitable for schools, but possibly best for the teachers. Prof. Marcus Hartog advocated accurate detailed descriptive and systematic work in botany as the remedy for a certain fluffiness of observation and description in nature-study.

The report on curricula deals in the first instance with boys' schools. The girls' schools had their turn when Prof. H. E. Armstrong addressed the section on *The Need of a Scientific Basis to Girls' Education from a Domestic Point of View.* Women should cease from competing with men to the neglect of their own interests and natural duties. A scheme of scientific education for girls might radiate from the household. Instead of chalk and salt, the common materials of the household, flour, starch, coal, meat, sugar, &c., might be used as starting points for a girl's study of science. The science of bread-making would lead to a general cooperation of all studies helpful to that end. The committee of Section L would like Prof. Armstrong's paper to have been published in full. It was a powerful enforcement of ideas advocated by Prof. Smithells in York.

The remaining hours were devoted to a discussion on *Types of Specialised Teaching.* Mr. J. H. Hawthorn, of Leicester, spoke on the teaching and the teacher in evening technical schools. The type of evening student has been changing, there are fewer adult workmen, and the average age is lower than ten years ago. No student should take a trade class until he has laid a foundation of pure science. Good results were obtained by a science teacher with a competent artisan demonstrator. The teacher keeps abreast of the trade when he is known to local factory owners, appreciated by them, and encouraged to visit factories. Mr. C. T. Millis, of the Borough Polytechnic spoke on problems of trade education considered in relation to our school system. Reforms are needed in our elementary-school education to make it an effective preparation for the battle of life, especially for those children who will take up industrial work. Too much attention has hitherto been given to those going into clerical occupations. The types of schools required are specialised trade schools for boys and girls of fourteen to sixteen years of age teaching definite trades, and also preparatory trade schools teaching practical mathematics, drawing, and science. The course must be planned to fit the elementary school at one end, and also to fit the system of apprenticeship followed in each trade. The labour market must be watched to guard against mistaken specialisation. The teacher of trades must have had trade experience in the factory. Cooperation of parents, teachers, employers, and trade-union leaders was necessary. Mrs. J. Ramsay Macdonald described the day trade schools for girls in greater detail. Women's work is double, wage-earning in factory and responsibility at home. To look upon the former as unimportant is disastrous to women wage-earners. There are now day classes in waistcoat-making, dressmaking, corset-making, and ladies' tailoring. The pupils mostly hold scholarships with maintenance grants. Six half-days are devoted to trade teaching, four half-days to general instruction. The trade teachers have come straight from good positions in the workroom. The pupils' development, not customers' convenience, is the first consideration.

An excellent paper on technical training of the rank and file, by Mr. J. C. Legge, of Liverpool, was in reserve, but under pressure of time and in his regretted absence it was distributed in abstract and taken as read.

It was most gratifying to have so good a discussion on these matters of technical and industrial training, which have been a special interest to the president, Sir Philip Magnus. Although not referred to in Section L, no account of technical education at the British Association would be complete without mention of Prof. S. P. Thompson's suggestions in Section G for the abolition of premium apprenticeship, and the opening of the best opportunities in engineering works to merit and not to wealth. From Section D we cull another pregnant idea. The little procession of blue-eyed and brown-eyed school children brought by Mr. Hurst from Burbage inevitably suggests the possibility of our pupils having Mendelian minds as well as Mendelian eyes.

The brief interim report on the conditions of health essential to the carrying on of the work of instruction in schools, presented by Sir Edward Brabrook, may seem inadequate to represent the interest of the association in such matters. But papers on school hygiene were deliberately avoided this year as the most effective method of supporting the simultaneous congress in London.

Two exhibitions were organised, one an exhibition of work representing practical and observational studies collected from the Leicester Council Schools by Mr. Charles Bird. The exhibition of school-science apparatus collected from several important schools by Mr. R. E. Thwaites was conveniently adjacent to the section room.

H. R.

LOCAL SOCIETIES AT THE BRITISH ASSOCIATION.

THE number of delegates from the local scientific societies which are in correspondence with the British Association was exceptionally large at the conference held during the Leicester meeting. Mr. H. J. Mackinder opened the session, in the council chamber of the municipal buildings, by an address on the advancement of geographical science by local scientific societies. He pointed out that in France there are about twenty local societies devoted to geographical study, each taking a region nearly corresponding with one of the old provinces, whilst in Germany there are many societies working specially for the furtherance of local geography. In this country each provincial scientific society should seek to correlate, from a geographical point of view, all the facts obtained by specialists in its own locality, taking as a basis a natural area rather than a county boundary. From such correlation, if undertaken by a person of special training, deductions could be drawn which would be of great value to specialists in the future. Until systematic work of this kind is accomplished on uniform principles throughout the country, no complete geographical conception of our land is possible. Captain Dubois Phillips, representing the Liverpool Geographical Society, referred to the stimulus which should be given to the rational study of geography by local societies through the influence of the British Association; and Dr. H. R. Mill bore testimony to the inspiriting character of the discourse, but feared that the complete realisation of Mr. Mackinder's scheme must be far distant.

At last year's conference of delegates it was suggested that the British Association should be asked to appoint a committee to organise a general photographic survey of the country, county by county. The suggestion was carefully considered by the Corresponding Societies Committee, but it was felt that the scheme was too vast to be taken up by the British Association. At the same time, it was considered that some section of the suggested work, such as archæology, might perhaps be advantageously undertaken. A discussion was therefore initiated by the Rev. R. Ashington Bullen, who read a paper at the Leicester conference on the advisability of appointing a committee for the photographic survey of ancient remains in the British Islands. The anthropological section held, however, that such work might be fairly undertaken by the committee which already exists for the collection and registration of anthropological photographs. As the result of much discussion the following resolutions, on the motion of Mr. W. Jerome Harrison, of Birmingham, were sent up to the Committee of Recommendations and ultimately referred to the Council:—That it is advisable to obtain information as to the present state of things in Britain, in connection with photo-survey work; to publish instructions, or give advice, for the execution of a scientific photographic survey; and to endeavour to found or promote a photo-record of the town and district in which the British Association holds its annual meetings.

At the second meeting, presided over by the Rev. J. O. Bevan, the local societies were urged to give greater